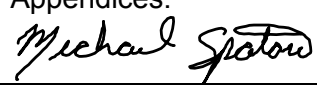



EMC EMISSIONS - TEST REPORT (Full)

Test Report No.	3103930-1a	Issue Date:	Mon 23/Oct/2006
Model / Serial No.	MN: 10-001 /SN: NA		
Product Type	SpiderIII T4 -R16 System/FCC CFR47 part 15.247 Radio		
Client	Goliath Solutions		
Manufacturer	Goliath Solutions		
License holder	Goliath Solutions		
Address	3082 Sterling Cr.		
	Boulder, CO 80301		
Test Criteria Applied	FCC CFR47 Part 15.247		
Test Result	PASS		
Test Project Number	3103930	Title 47 CFR 15: RADIO FREQUENCY DEVICES	
References			
Total Pages			
Including			
Appendices:	39		
			
Reviewed By : Michael Spataro		Approved By : Robert Cresswell	

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Lab Code:200264-0

The entity logos above are for reference only and may not apply to this test report.

D I R E C T O R Y

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STATEMENT OF MEASUREMENT UNCERTAINTY

The data and results referenced in this document are true and accurate. The measurement uncertainty for Conducted Emissions in the frequency range of 150kHz – 30MHz is calculated to be $\pm 2.30\text{dB}$ and for Radiated Emissions is calculated to be $\pm 3.60\text{dB}$ in the frequency range of 30MHz – 200MHz and $\pm 3.38\text{dB}$ in the frequency range of 200MHz – 1000MHz.

REVISION SUMMARY - The following changes have been made to this Report:

Rev.	Revision Statement	Pages	Author	Revision Date
	Initial Release of Document		Mike Spataro	09/22/2006
A	Added maximum power statement to General remarks. Added 15.247(d) to separator pages.	4, 17 and 21	Mike Spataro	10/23/2006

EUT Received Date: 11-Sept-2006

Testing Start Date: 11-Sept-2006

Testing End Date: 15-Sept-2006

The tests were performed according to following regulations :

1. FCC CFR47 Part 15 subpart C

Emission Test Results:

Conducted Emissions, Powerline (15.207) - PASS

Test Result

Minimum limit margin -2.6 dB at 1.64 MHz

Maximum limit exceeding _____ dB at _____ MHz

Remarks: _____

Radiated Emissions (15.209) - PASS

Test Result

Minimum limit margin -14.4 dB at 9500.00 MHz

Maximum limit exceeding _____ dB at _____ MHz

Remarks: _____

Radiated Emissions (15.205)/(15.247) (c) - PASS

Test Result

Minimum limit margin -0.1 dB at 3704.22 MHz

Maximum limit exceeding _____ dB at _____ MHz

Remarks: Reading found on Tx port 2 from the high channel.

Peak Output Power 15.247 (b)(2) - PASS

Test Result

Minimum limit margin -4.9 dB at 905.04 MHz

Maximum limit exceeding _____ dB at _____ MHz

Remarks: _____

Bandwidth 15.247 (a)(1)(i) - PASS

Remarks: If the 20dB bandwidth is less than 250kHz the unit shall employ at least 50 hopping channels

Power Spectral Density 15.247 (e) - NA

Remarks: The power spectral density conducted to the antenna shall be less than +8dBm.

GENERAL REMARKS:

The following remarks are to be considered as “where applicable” and are taken into account while completing any FCC/IC/ETSI radio tests at Intertek, ETL Semko.

Testing was performed in 3 different orthogonal axis to determine the worst case emissions from the device. The worst case emissions measurements are shown in this report.

FCC CFR47 Part 15.31: Measurement Standards: In any case where the device is powered off a battery, a fresh battery was used during test. In cases where the device is powered off an AC supply, voltage was varied per Part 15.31 to find worst case emissions.

FCC CFR47 Part 15.35: Measurement Detector Functions and Bandwidths: FCC Part 15.35 was utilized when performing the measurements within this report.

Whenever possible the approved test procedures specified in FCC KDB 558074 for DTS devices was used for testing.

Limit Calculation:

At the time of testing, Intertek ETL Semko was unable to obtain the gain of the antenna for the EUT from the manufacture of the EUT or from the manufacture of the antenna. Therefore, the following calculation was used to determine the field strength limit for a test distance of 3m. This calculation assumes ideal isotropic radiation from the source.

$$P = 20 \cdot \log(E) - 95.2289$$

P is power in dBm

E is uV/m

All measurements were made at the highest power level specified by the manufacture.

Modifications required to pass: None

Test Specification Deviations: Additions to or Exclusions from: None

Required Information In Accordance to FCC CFR 47 Part 2.1033:

<i>Rule Part 11, 15 & 18 Devices</i>	<i>Other Rule Part Devices</i>	<i>Description</i>	<i>Comments</i>
2.1033(b)(1)	2.1033(c)(1)	Manu. Contact	See Page 1 of this report
2.1033(b)(2)	2.1033(c)(2)	FCC Identifier	
2.1033(b)(3)	2.1033(c)(3)	Users Manual to include Operating, installation	Attached as Exhibit
	2.1033(c)(4)	Emissions Designator per 2.	
	2.1033(c)(5)	Frequency Range	Not Applicable to Part 15 Devcies
	2.1033(c)(6)	Power range and controls	Not Applicable to Part 15 Devcies
	2.1033(c)(7)	Maximum power ouput rating	Not Applicable to Part 15 Devcies
	2.1033(c)(8)	DC Voltage and Current suplying final RF stages	Not Applicable to Part 15 Devcies
2.1033(b)(3)	2.1033(c)(9)	Tune –up procedure	Please refer to the users manual for applicability
2.1033(b)(4&5)	2.1033(c)(10)	Complete Circuit Diagrams and circuit operation description	Attached as Exhibit
2.1033(b)(7)	2.1033(c)(11)	Photographs/drawings of the identification label & its location on the device	Attached as Exhibit
2.1033(b)(7)	2.1033(c)(12)	Photographs of the external and internal surfaces, and construction	Attached as Exhibit
	2.1033(c)(13)	Digital Modulation	Not Applicable
2.1033(b)(6)	2.1033(c)(14)	Report of Measurement Data Required by 2.1046 – 2.1057	See Data
2.1033(b)(8)		Description of publicly available support equipment used during test	Refer to Appendix B of this report (Client Test Plan)
2.1033(b)(9)		Statement of Autorization to Part 15.37 of CFR47	The equipment herein is being authorized in accordance to 15.37 of the CFR47 Rules.
2.1033(b)(10)		Direct Sequence Spread Spectrum Devices (DSSS)	Exhibit of compliance to 15.247(e)
2.1033(b)(10)		Frequency Hopping Devices	Exhibit of compliance to 15.247(a)(1)
2.1033(b)(11)		Scanning receiver construction	Exhibit stating compliance to construction in accordance to 15.121.
15.31	15.31	Transmitter Supply Voltage	Testing herein was completed in accordance to FCC CFR47 Part 15.31

Exhibits Including (where applicable):

- | | |
|------------------------------------|---|
| 1. Users Manual | 7. Parts List |
| 2. Operation Description | 8. Tuning Procedure (if applicable) |
| 3. Block Diagram | 9. Test Setup Photograph |
| 4. Report of Measurement | 10. Label Drawings and or Photograpghs |
| 5. External & Internal Photographs | 11. Description of Support Equipment (where Applicable) |
| 6. Schematic | |

Required Information in Accordance to Industry Canada Regulations (In addition to the above):

<i>Information Required</i>	<i>Description</i>	<i>Comments</i>
Modulation Type	(i.e. ASK, NON, FSK, DSSS, FHSS, etc.)	
Emissions Designator	Per TRC-49	
In Country Representative	Contact Information	
99% Bandwidth Measurement	Per RSS-210	

Test-setup photo(s):
Conducted Emissions



Test-setup photo(s):
Conducted Emissions



Test-setup photo(s):
Radiated Emissions:



Test-setup photo(s):
Radiated Emissions:



Appendix A

Test Data Sheets and Test Equipment Used

1.1310 Calculation

RF Exposure limits.

RF Exposure

Test Report #:	3103930	Test Area:	Pinewood Site 1 (3m)
Test Method:	FCC CFR47 Part 1.1310	Test Date:	13-Sep-2006
EUT Model #:	10-001	EUT Power:	120 VAC 60 Hz
EUT Serial #:			
Manufacturer:	Goliath Solutions		
EUT Description:	SpiderIII T4 -R16 System		
Notes:			

Temperature:	20	°C
Relative Humidity:	30.2	%
Air Pressure:	102	kPa

The following limit was calculated from table 1 (B) Limits for General Population/Uncontrolled Exposure in FCC part 1.1310:

$$L=f/1500$$

Using the lowest transmit frequency from the EUT of 905MHz

$$L=0.603\text{mW/cm}^2$$

The following calculation was used to determine compliance to the above limit.
The following assumes the gain of the antenna to be ≤ 1 .

$$P(\text{W/cm}^2)=(E^2/R)/10000$$

E=Field Strength in this case, the maximum recorded field strength from the fundamental at 3m.
120.1dBuV/m =1.011V

$$R=377\Omega$$

In this case P

$$=.000000271$$

Or

$$.000271\text{mW/cm}^2$$

15.207 Test Data

Conducted Electromagnetic Emissions



Test Report #:	3103930 Run 01	Test Area:	Pinewood Site 1 Cond
Test Method:	FCC Part 15.207	Test Date:	15-Sep-2006
EUT Model #:	10-001	EUT Power:	120 VAC 60 Hz
EUT Serial #:	ESN CC16D000		
Manufacturer:	Goliath Solutions		
EUT Description:	SpiderIII T4 -R16 System		
Notes:	Tx Port 1 Antenna 1		

Temperature:	°C
Relative Humidity:	%
Air Pressure:	kPa

Level Key	
Pk – Peak	Nb – Narrow Band
Qp – QuasiPeak	Bb – Broad Band
Av - Average	

FREQ (MHz)	LEVEL (dBuV)	CABLE / LISN / ATTEN (dB)	FINAL (dBuV)	TEST POINT	DELTA1 (dB) QP15.207	DELTA2 (dB) AV15.207
0.150	31.6 Qp	0.1 / 0.1 / -9.4	41.3	Neutral	-24.7	N/A
0.177	33.0 Qp	0.1 / 0.1 / -9.6	42.8	Neutral	-21.8	N/A
0.177	22.1 Av	0.1 / 0.1 / -9.6	31.9	Neutral	N/A	-22.7
0.235	30.9 Qp	0.1 / 0.1 / -9.7	40.9	Neutral	-21.4	N/A
0.235	24.8 Av	0.1 / 0.1 / -9.7	34.8	Neutral	N/A	-17.5
0.411	32.2 Qp	0.1 / 0.1 / -9.9	42.3	Neutral	-15.3	N/A
0.411	29.2 Av	0.1 / 0.1 / -9.9	39.3	Neutral	N/A	-8.3
0.705	31.6 Qp	0.1 / 0.2 / -9.9	41.8	Neutral	-14.2	N/A
0.705	29.3 Av	0.1 / 0.2 / -9.9	39.5	Neutral	N/A	-6.5
1.64	35.7 Qp	0.3 / 0.2 / -9.9	46.1	Neutral	-9.9	N/A
1.64	30.8 Av	0.3 / 0.2 / -9.9	41.2	Neutral	N/A	-4.8
2.46	28.0 Qp	0.3 / 0.2 / -9.9	38.5	Neutral	-17.5	N/A
2.46	26.0 Av	0.3 / 0.2 / -9.9	36.5	Neutral	N/A	-9.5
4.28	22.9 Qp	0.3 / 0.3 / -9.9	33.5	Neutral	-22.5	N/A
4.28	22.4 Av	0.3 / 0.3 / -9.9	33.0	Neutral	N/A	-13.0
13.96	24.4 Qp	0.7 / 0.8 / -10.0	35.9	Neutral	-24.1	N/A
13.96	20.4 Av	0.7 / 0.8 / -10.0	31.9	Neutral	N/A	-18.1
18.31	20.5 Qp	0.9 / 1.3 / -10.0	32.7	Neutral	-27.3	N/A
18.31	16.8 Av	0.9 / 1.3 / -10.0	29.0	Neutral	N/A	-21.0
22.58	18.7 Qp	1.0 / 1.7 / -10.0	31.4	Neutral	-28.6	N/A
22.58	12.9 Av	1.0 / 1.7 / -10.0	25.6	Neutral	N/A	-24.4
30.00	2.4 Qp	1.2 / 2.1 / -10.0	15.7	Neutral	-44.3	N/A
Line						
0.150	31.6 Qp	0.1 / 0.1 / -9.4	41.3	Line 1	-24.7	N/A
0.175	31.0 Qp	0.1 / 0.1 / -9.6	40.8	Line 1	-23.9	N/A
0.175	19.7 Av	0.1 / 0.1 / -9.6	29.5	Line 1	N/A	-25.2
0.235	28.7 Qp	0.1 / 0.1 / -9.7	38.7	Line 1	-23.6	N/A
0.235	22.9 Av	0.1 / 0.1 / -9.7	32.9	Line 1	N/A	-19.4
0.411	31.9 Qp	0.1 / 0.1 / -9.9	42.0	Line 1	-15.6	N/A

FREQ	LEVEL	CABLE / LISN / ATTEN	FINAL	TEST POINT	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB)	(dBuV)		QP15.207	AV15.207
0.704	30.8 Qp	0.1 / 0.2 / -9.9	41.0	Line 1	-15.0	N/A
1.64	36.6 Qp	0.3 / 0.2 / -9.9	47.0	Line 1	-9.0	N/A
1.64	33.0 Av	0.3 / 0.2 / -9.9	43.4	Line 1	N/A	-2.6
2.46	28.7 Qp	0.3 / 0.2 / -9.9	39.2	Line 1	-16.8	N/A
2.46	23.2 Av	0.3 / 0.2 / -9.9	33.7	Line 1	N/A	-12.3
4.28	19.5 Qp	0.3 / 0.3 / -10.0	30.1	Line 1	-25.9	N/A
4.28	17.2 Av	0.3 / 0.3 / -10.0	27.8	Line 1	N/A	-18.2
13.95	24.9 Qp	0.7 / 0.8 / -10.0	36.4	Line 1	-23.6	N/A
13.95	22.0 Av	0.7 / 0.8 / -10.0	33.5	Line 1	N/A	-16.5
18.29	19.6 Qp	0.9 / 1.3 / -10.0	31.8	Line 1	-28.2	N/A
18.29	17.1 Av	0.9 / 1.3 / -10.0	29.3	Line 1	N/A	-20.7
22.57	19.7 Qp	1.0 / 1.7 / -10.0	32.4	Line 1	-27.6	N/A
22.57	14.9 Av	1.0 / 1.7 / -10.0	27.6	Line 1	N/A	-22.4
30.00	3.1 Qp	1.2 / 2.1 / -10.0	16.3	Line 1	-43.7	N/A
End of Run						

FREQ	LEVEL	CABLE / LISN / ATTEN	FINAL	TEST POINT	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB)	(dBuV)		QP15.207	AV15.207
***** Measurement Summary *****						
1.64	33.0 Av	0.3 / 0.2 / -9.9	43.4	Line 1	N/A	-2.6
0.705	29.3 Av	0.1 / 0.2 / -9.9	39.5	Neutral	N/A	-6.5
0.411	29.2 Av	0.1 / 0.1 / -9.9	39.3	Neutral	N/A	-8.3
2.46	26.0 Av	0.3 / 0.2 / -9.9	36.5	Neutral	N/A	-9.5
4.28	22.4 Av	0.3 / 0.3 / -9.9	33.0	Neutral	N/A	-13.0
13.95	22.0 Av	0.7 / 0.8 / -10.0	33.5	Line 1	N/A	-16.5
0.235	24.8 Av	0.1 / 0.1 / -9.7	34.8	Neutral	N/A	-17.5
13.96	20.4 Av	0.7 / 0.8 / -10.0	31.9	Neutral	N/A	-18.1
18.29	17.1 Av	0.9 / 1.3 / -10.0	29.3	Line 1	N/A	-20.7
18.31	16.8 Av	0.9 / 1.3 / -10.0	29.0	Neutral	N/A	-21.0
0.177	33.0 Qp	0.1 / 0.1 / -9.6	42.8	Neutral	-21.8	N/A
22.57	14.9 Av	1.0 / 1.7 / -10.0	27.6	Line 1	N/A	-22.4
13.95	24.9 Qp	0.7 / 0.8 / -10.0	36.4	Line 1	-23.6	N/A
13.96	24.4 Qp	0.7 / 0.8 / -10.0	35.9	Neutral	-24.1	N/A
22.58	12.9 Av	1.0 / 1.7 / -10.0	25.6	Neutral	N/A	-24.4
0.150	31.6 Qp	0.1 / 0.1 / -9.4	41.3	Line 1	-24.7	N/A
30.00	3.1 Qp	1.2 / 2.1 / -10.0	16.3	Line 1	-43.7	N/A

15.247(d) / 15.209 Test Data

Radiated Electromagnetic Emissions

Test Report #:	3103930 Run 5	Test Area:	Pinewood Site 1 (3m)	Temperature:	20.0	°C
Test Method:	FCC Part 15.209	Test Date:	15-Sep-2006	Relative Humidity:	30	%
EUT Model #:	10-001	EUT Power:	120 VAC 60 Hz	Air Pressure:	81	kPa
EUT Serial #:	ESN CC16D000					
Manufacturer:	Goliath Solutions					
EUT Description:	SpiderIII T4 -R16 System					
Notes:	Tx Port 1 Antenna 1					

Level Key	
Pk – Peak	Nb – Narrow Band
Qp – QuasiPeak	Bb – Broad Band
Av - Average	

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB) (dBm) (dB)	(dBuV)	(m) (DEG)	15.209 <1GHz	15.209 >1GHz
No significant emissions detected other than harmonics.						
The following are noise floor points 1-10 GHz, Vertical.						
1500.00	34.0 Av	2.9 / 25.4 / 35.1	27.2	V / 1.0 / 0.0	N/A	-26.8
2500.01	34.5 Av	4.0 / 28.8 / 35.5	31.8	V / 1.0 / 0.0	N/A	-22.2
3500.01	34.3 Av	4.8 / 31.4 / 34.8	35.7	V / 1.0 / 0.0	N/A	-18.3
4500.00	32.0 Av	6.6 / 32.5 / 41.2	29.9	V / 1.0 / 0.0	N/A	-24.1
5500.00	30.9 Av	6.7 / 34.5 / 41.1	31.0	V / 1.0 / 0.0	N/A	-23.0
6500.00	31.7 Av	8.5 / 35.2 / 41.5	33.9	V / 1.0 / 0.0	N/A	-20.1
7500.00	30.9 Av	8.2 / 37.0 / 41.3	34.8	V / 1.0 / 0.0	N/A	-19.2
8500.00	41.0 Av	8.5 / 37.8 / 50.9	36.4	V / 1.0 / 0.0	N/A	-17.6
9500.00	41.8 Av	9.4 / 38.8 / 50.4	39.6	V / 1.0 / 0.0	N/A	-14.4
Horizontal						
No significant emissions detected.						
The following are noise floor points between 1 - 10 GHz, Horizontal.						
9000.00	41.6 Av	8.5 / 38.5 / 51.1	37.5	H / 1.0 / 0.0	N/A	-16.5
8000.00	39.7 Av	8.3 / 37.2 / 49.4	35.8	H / 1.0 / 0.0	N/A	-18.2
7000.00	31.6 Av	8.1 / 35.7 / 42.5	32.9	H / 1.0 / 0.0	N/A	-21.1
6000.00	30.5 Av	7.7 / 34.6 / 41.2	31.6	H / 1.0 / 0.0	N/A	-22.4
5000.00	31.5 Av	7.6 / 33.6 / 41.1	31.6	H / 1.0 / 0.0	N/A	-22.4
4000.00	31.3 Av	5.7 / 32.7 / 42.1	27.6	H / 1.0 / 0.0	N/A	-26.4
3000.01	33.6 Av	4.6 / 30.4 / 34.5	34.1	H / 1.0 / 0.0	N/A	-19.9
2000.01	34.2 Av	3.2 / 27.4 / 35.3	29.5	H / 1.0 / 0.0	N/A	-24.5
1000.00	33.0 Av	3.7 / 23.9 / 36.2	24.4	H / 1.0 / 0.0	N/A	-29.6
No significant emissions detected between 200 - 1000 MHz, Vertical.						
The following are noise floor points.						
200.00	22.1 Qp	1.5 / 11.5 / 24.7	10.5	V / 1.0 / 0.0	-33.0	N/A
350.00	18.1 Qp	2.1 / 15.2 / 26.8	8.6	V / 1.0 / 0.0	-37.4	N/A
500.00	18.7 Qp	2.6 / 18.8 / 28.0	12.1	V / 1.0 / 0.0	-33.9	N/A
650.00	19.0 Qp	3.0 / 20.2 / 27.9	14.3	V / 1.0 / 0.0	-31.7	N/A
800.00	19.5 Qp	3.3 / 21.7 / 27.6	16.9	V / 1.0 / 0.0	-29.1	N/A
950.00	18.9 Qp	3.7 / 23.5 / 27.2	18.9	V / 1.0 / 0.0	-27.1	N/A

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	15.209 <1GHz	15.209 >1GHz
250.00	18.3 Qp	1.7 / 12.3 / 24.9	7.4	H / 1.0 / 0.0	-38.6	N/A
400.00	18.1 Qp	2.2 / 16.0 / 27.4	8.9	H / 1.0 / 0.0	-37.1	N/A
550.00	19.3 Qp	2.6 / 19.3 / 28.0	13.2	H / 1.0 / 0.0	-32.8	N/A
700.00	19.4 Qp	3.3 / 21.6 / 27.8	16.5	H / 1.0 / 0.0	-29.5	N/A
850.00	19.0 Qp	3.4 / 22.4 / 27.4	17.4	H / 1.0 / 0.0	-28.6	N/A
995.00	18.5 Qp	3.7 / 24.0 / 27.1	19.2	H / 1.0 / 0.0	-34.8	N/A
The following were maximized between 30 - 200 MHz, Vertical.						
167.97	32.4 Qp	1.4 / 12.5 / 24.1	22.2	V / 1.0 / 35.0	-21.3	N/A
49.22	23.7 Qp	0.7 / 10.4 / 14.3	20.6	V / 1.0 / 35.0	-19.4	N/A
42.76	23.8 Qp	0.7 / 11.3 / 14.5	21.3	V / 1.0 / 43.0	-18.7	N/A
49.22	25.7 Qp	0.7 / 10.4 / 14.3	22.5	V / 1.0 / 96.0	-17.5	N/A
No other significant emissions detected, the following are noise floor points.						
35.00	18.8 Qp	0.6 / 12.4 / 12.8	18.9	V / 1.0 / 0.0	-21.1	N/A
175.00	20.6 Qp	1.4 / 12.6 / 24.0	10.7	V / 1.0 / 0.0	-32.8	N/A
The following were maximized between 30 - 200 MHz, Horizontal.						
42.76	21.2 Qp	0.7 / 11.3 / 14.5	18.8	H / 1.0 / 70.0	-21.2	N/A
49.22	22.7 Qp	0.7 / 10.4 / 14.3	19.6	H / 1.0 / 325.0	-20.4	N/A
167.97	21.6 Qp	1.4 / 12.5 / 24.1	11.3	H / 1.2 / 65.0	-32.2	N/A
NO other significant emissions detected between 30 - 200 Mhz. The following are noise floor points.						
50.00	18.6 Qp	0.7 / 10.3 / 14.2	15.3	H / 1.6 / 0.0	-24.7	N/A
150.00	18.3 Qp	1.3 / 12.3 / 23.3	8.6	H / 1.6 / 0.0	-34.9	N/A
Loop antenna is parallel						
No significant emissions detected between 32 kHz and 30 MHz. The following are noise floor points.						
0.0320	47.1 Qp	0.0 / 12.6 / 0.0	59.7	V / 1.0 / 0.0	-57.8	N/A
2.00	23.9 Qp	0.1 / 10.7 / 0.0	34.7	V / 1.0 / 0.0	-34.8	N/A
11.00	11.4 Qp	0.2 / 10.7 / 0.0	22.4	V / 1.0 / 0.0	-47.1	N/A
25.00	9.4 Qp	0.5 / 9.1 / 0.0	19.0	V / 1.0 / 0.0	-50.5	N/A
Loop antenna is perpendicular						
0.100	51.9 Qp	0.1 / 11.2 / 0.0	63.2	H / 1.0 / 0.0	-44.4	N/A
4.00	17.8 Qp	0.2 / 10.7 / 0.0	28.6	H / 1.0 / 0.0	-40.9	N/A
15.00	15.3 Qp	0.3 / 10.8 / 0.0	26.4	H / 1.0 / 0.0	-43.1	N/A
20.00	12.7 Qp	0.4 / 10.3 / 0.0	23.4	H / 1.0 / 0.0	-46.1	N/A
End of Run						

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	15.209 <1GHz	15.209 >1GHz
***** Measurement Summary *****						
9500.00	41.8 Av	9.4 / 38.8 / 50.4	39.6	V / 1.0 / 0.0	N/A	-14.4
9000.00	41.6 Av	8.5 / 38.5 / 51.1	37.5	H / 1.0 / 0.0	N/A	-16.5
49.22	25.7 Qp	0.7 / 10.4 / 14.3	22.5	V / 1.0 / 96.0	-17.5	N/A
8500.00	41.0 Av	8.5 / 37.8 / 50.9	36.4	V / 1.0 / 0.0	N/A	-17.6
8000.00	39.7 Av	8.3 / 37.2 / 49.4	35.8	H / 1.0 / 0.0	N/A	-18.2
3500.01	34.3 Av	4.8 / 31.4 / 34.8	35.7	V / 1.0 / 0.0	N/A	-18.3
42.76	23.8 Qp	0.7 / 11.3 / 14.5	21.3	V / 1.0 / 43.0	-18.7	N/A
7500.00	30.9 Av	8.2 / 37.0 / 41.3	34.8	V / 1.0 / 0.0	N/A	-19.2
3000.01	33.6 Av	4.6 / 30.4 / 34.5	34.1	H / 1.0 / 0.0	N/A	-19.9
6500.00	31.7 Av	8.5 / 35.2 / 41.5	33.9	V / 1.0 / 0.0	N/A	-20.1
35.00	18.8 Qp	0.6 / 12.4 / 12.8	18.9	V / 1.0 / 0.0	-21.1	N/A
7000.00	31.6 Av	8.1 / 35.7 / 42.5	32.9	H / 1.0 / 0.0	N/A	-21.1
167.97	32.4 Qp	1.4 / 12.5 / 24.1	22.2	V / 1.0 / 35.0	-21.3	N/A
2500.01	34.5 Av	4.0 / 28.8 / 35.5	31.8	V / 1.0 / 0.0	N/A	-22.2
5000.00	31.5 Av	7.6 / 33.6 / 41.1	31.6	H / 1.0 / 0.0	N/A	-22.4
6000.00	30.5 Av	7.7 / 34.6 / 41.2	31.6	H / 1.0 / 0.0	N/A	-22.4
5500.00	30.9 Av	6.7 / 34.5 / 41.1	31.0	V / 1.0 / 0.0	N/A	-23.0
4500.00	32.0 Av	6.6 / 32.5 / 41.2	29.9	V / 1.0 / 0.0	N/A	-24.1
2000.01	34.2 Av	3.2 / 27.4 / 35.3	29.5	H / 1.0 / 0.0	N/A	-24.5
50.00	18.6 Qp	0.7 / 10.3 / 14.2	15.3	H / 1.6 / 0.0	-24.7	N/A
4000.00	31.3 Av	5.7 / 32.7 / 42.1	27.6	H / 1.0 / 0.0	N/A	-26.4
1500.00	34.0 Av	2.9 / 25.4 / 35.1	27.2	V / 1.0 / 0.0	N/A	-26.8
950.00	18.9 Qp	3.7 / 23.5 / 27.2	18.9	V / 1.0 / 0.0	-27.1	N/A
850.00	19.0 Qp	3.4 / 22.4 / 27.4	17.4	H / 1.0 / 0.0	-28.6	N/A
800.00	19.5 Qp	3.3 / 21.7 / 27.6	16.9	V / 1.0 / 0.0	-29.1	N/A
700.00	19.4 Qp	3.3 / 21.6 / 27.8	16.5	H / 1.0 / 0.0	-29.5	N/A
1000.00	33.0 Av	3.7 / 23.9 / 36.2	24.4	H / 1.0 / 0.0	N/A	-29.6
650.00	19.0 Qp	3.0 / 20.2 / 27.9	14.3	V / 1.0 / 0.0	-31.7	N/A
175.00	20.6 Qp	1.4 / 12.6 / 24.0	10.7	V / 1.0 / 0.0	-32.8	N/A
550.00	19.3 Qp	2.6 / 19.3 / 28.0	13.2	H / 1.0 / 0.0	-32.8	N/A
200.00	22.1 Qp	1.5 / 11.5 / 24.7	10.5	V / 1.0 / 0.0	-33.0	N/A
500.00	18.7 Qp	2.6 / 18.8 / 28.0	12.1	V / 1.0 / 0.0	-33.9	N/A
2.00	23.9 Qp	0.1 / 10.7 / 0.0	34.7	V / 1.0 / 0.0	-34.8	N/A
995.00	18.5 Qp	3.7 / 24.0 / 27.1	19.2	H / 1.0 / 0.0	-34.8	N/A
150.00	18.3 Qp	1.3 / 12.3 / 23.3	8.6	H / 1.6 / 0.0	-34.9	N/A
400.00	18.1 Qp	2.2 / 16.0 / 27.4	8.9	H / 1.0 / 0.0	-37.1	N/A
350.00	18.1 Qp	2.1 / 15.2 / 26.8	8.6	V / 1.0 / 0.0	-37.4	N/A
250.00	18.3 Qp	1.7 / 12.3 / 24.9	7.4	H / 1.0 / 0.0	-38.6	N/A
4.00	17.8 Qp	0.2 / 10.7 / 0.0	28.6	H / 1.0 / 0.0	-40.9	N/A
15.00	15.3 Qp	0.3 / 10.8 / 0.0	26.4	H / 1.0 / 0.0	-43.1	N/A
0.100	51.9 Qp	0.1 / 11.2 / 0.0	63.2	H / 1.0 / 0.0	-44.4	N/A
20.00	12.7 Qp	0.4 / 10.3 / 0.0	23.4	H / 1.0 / 0.0	-46.1	N/A
11.00	11.4 Qp	0.2 / 10.7 / 0.0	22.4	V / 1.0 / 0.0	-47.1	N/A
25.00	9.4 Qp	0.5 / 9.1 / 0.0	19.0	V / 1.0 / 0.0	-50.5	N/A
0.0320	47.1 Qp	0.0 / 12.6 / 0.0	59.7	V / 1.0 / 0.0	-57.8	N/A

15.247 (b)(2), (c), and (d)/15.205 Test Data

Data sheets are in the following order:

Tx port 1

Tx port 2

Tx port 3

Tx port 4

Field Strength Measurements Fundamental and Harmonics of the Transmitter

Test Report #:	3103930	Test Area:	Pinewood Site 1 (3m)	Temperature:	20	°C
Test Method:	FCC CFR47 part 15.247	Test Date:	13-Sep-2006	Relative Humidity:	30.2	%
EUT Model #:	10-001	EUT Power:	120 VAC 60 Hz	Air Pressure:	102	kPa
EUT Serial #:						
Manufacturer:	Goliath Solutions					
EUT Description:	SpiderIII T4 -R16 System					
Notes:	Tx Port 1					
	Worst case axis was determined during previous testing.					
	No duty cycle correction factor was used.					

Level Key	
Pk – Peak	Nb – Narrow Band
Qp – QuasiPeak	Bb – Broad Band
Av - Average	

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	Duty Cycle Correction	Final Corrected	Limit	DELTA
(MHz)	(dBuV)	(dB) (dBm) (dB)	(dBuV)	(m) (DEG)	(dB)	(dBuV/m)	(dBuV/m)	(dB)

Averaging method for pulsed signals and calculation in accordance to FCC CFR47 Part 15.35 utilized to calculate field strength emissions.

The testing performed in accordance to FCC CFR47 Part 15.205 (restricted bands of operation) and 15.247 emissions and delta limits were calculated as follows:

Final Corrected Peak Measurement – Duty Cycle Correction Factor* = Final Calculated Emission

The Final Calculated Emission was then compared to the Limits in CFR47 Part 15.209 and 15.247 and the emission/limit delta was calculated.

the DTCF is calculated as follows $20 \cdot \log_{10}(\text{duty cycle in 100ms})$ "not to exceed 20dB"

Part 15.247 and **15.205** Respectively

TX port 1

Low Channel Fundamental

905.04	92.0 Pk	3.6 / 23.2 / 0.0	118.7	H / 1.7 / 265.0	0.0	118.7	125.0	-6.3
905.04	93.3 Pk	3.6 / 23.2 / 0.0	120.1	V / 1.0 / 23.0	0.0	120.1	125.0	-4.9

Mid Channel Fundamental

915.05	87.4 Pk	3.6 / 23.2 / 0.0	114.2	H / 1.0 / 130.0	0.0	114.2	125.0	-10.8
915.05	89.7 Pk	3.6 / 23.2 / 0.0	116.5	V / 1.0 / 15.0	0.0	116.5	125.0	-8.5

High Channel Fundamental

926.05	88.0 Pk	3.6 / 23.3 / 0.0	114.9	V / 1.0 / 12.0	0.0	114.9	125.0	-10.1
926.05	90.3 Pk	3.6 / 23.3 / 0.0	117.2	H / 2.4 / 17.0	0.0	117.2	125.0	-7.8

Low Channel Harmonics.

1810.10	55.5 Pk	3.1 / 26.6 / 36.1	49.1	V / 1.0 / 107.0	0.0	49.1	105.0	-55.9
1810.10	50.5 Pk	3.1 / 26.6 / 36.1	44.1	H / 1.0 / 295.0	0.0	44.1	105.0	-60.9
2715.10	53.2 Pk	4.3 / 29.5 / 37.3	49.7	V / 1.0 / 300.0	0.0	49.7	54.0	-4.3
2715.10	54.6 Pk	4.3 / 29.5 / 37.3	51.1	H / 1.1 / 307.0	0.0	51.9	54.0	-2.1
3620.15	49.9 Pk	5.0 / 31.7 / 38.1	48.6	V / 1.0 / 15.0	0.0	48.6	54.0	-5.4
3620.15	50.8 Pk	5.0 / 31.7 / 38.1	49.5	H / 1.4 / 200.0	0.0	49.5	54.0	-4.5
4525.25	53.3 Pk	6.7 / 32.6 / 41.2	51.3	V / 1.0 / 143.0	0.0	51.3	54.0	-2.7
4525.25	48.1 Pk	6.7 / 32.6 / 41.2	46.1	H / 1.3 / 103.0	0.0	46.1	54.0	-7.9
5430.35	45.5 Pk	6.8 / 34.4 / 40.7	45.9	V / 1.0 / 310.0	0.0	45.9	54.0	-8.1
5430.35	45.6 Pk	6.8 / 34.4 / 40.7	46.1	H / 1.3 / 72.0	0.0	46.1	54.0	-7.9
6335.35	48.9 Pk	8.2 / 35.0 / 41.5	50.6	V / 1.0 / 115.0	0.0	50.6	105.0	-54.4
6335.35	47.9 Pk	8.2 / 35.0 / 41.5	49.6	H / 1.2 / 320.0	0.0	49.6	105.0	-55.4
7240.35	43.5 Pk	8.1 / 36.3 / 42.0	46.1	V / 1.0 / 0.0	0.0	46.1	105.0	-58.9
7240.35	42.8 Pk	8.1 / 36.3 / 42.0	45.3	H / 1.0 / 0.0	0.0	45.3	105.0	-59.7
8145.35	50.5 Pk	8.4 / 37.4 / 50.0	46.2	V / 1.0 / 0.0	0.0	46.2	54.0	-7.8
8145.35	51.8 Pk	8.4 / 37.4 / 50.0	47.5	H / 1.0 / 0.0	0.0	47.5	54.0	-6.5
9050.35	54.0 Pk	8.6 / 38.5 / 51.3	49.9	V / 1.0 / 0.0	0.0	49.9	54.0	-4.1
9050.35	54.5 Pk	8.6 / 38.5 / 51.3	50.4	H / 1.0 / 0.0	0.0	50.4	54.0	-3.6

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	Duty Cycle Correction	Final Corrected	Limit	DELTA
(MHz)	(dBuV)	(dB) (dBm) (dB)	(dBuV)	(m) (DEG)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
Part 15.247 and 15.205 Respectively								
Mid Channel Harmonics								
1830.15	55.5 Pk	3.1 / 26.7 / 36.3	49	H / 1.1 / 143.0	0.0	49	105.0	-56.0
1830.15	54.3 Pk	3.1 / 26.7 / 36.3	47.8	V / 1.0 / 210.0	0.0	47.8	105.0	-57.2
2745.20	53.7 Pk	4.3 / 29.6 / 37.4	50.2	H / 1.1 / 152.0	0.0	50.2	54.0	-3.8
2745.20	55.3 Pk	4.3 / 29.6 / 37.4	51.8	V / 1.0 / 323.0	0.0	51.8	54.0	-2.2
3660.20	51.2 Pk	5.1 / 31.8 / 38.1	50	H / 1.8 / 147.0	0.0	50	54.0	-4.0
3660.20	50.4 Pk	5.1 / 31.8 / 38.1	49.2	V / 1.1 / 123.0	0.0	49.2	54.0	-4.8
4575.25	49.3 Pk	6.8 / 32.7 / 41.2	47.5	H / 1.3 / 10.0	0.0	47.5	54.0	-6.5
4575.25	52.7 Pk	6.8 / 32.7 / 41.2	50.9	V / 1.1 / 22.0	0.0	50.9	54.0	-3.1
5490.40	45.4 Pk	6.7 / 34.5 / 41.1	45.5	H / 1.3 / 100.0	0.0	45.5	105.0	-59.5
5490.40	45.1 Pk	6.7 / 34.5 / 41.1	45.3	V / 1.2 / 30.0	0.0	45.3	105.0	-59.7
6405.40	46.9 Pk	8.3 / 35.1 / 41.7	48.7	H / 1.2 / 285.0	0.0	48.7	105.0	-56.3
6405.40	52.6 Pk	8.3 / 35.1 / 41.7	54.4	V / 1.3 / 37.0	0.0	54.4	105.0	-50.6
7320.00	42.0 Pk	8.2 / 36.5 / 41.6	45.2	H / 1.0 / 0.0	0.0	45.2	54.0	-8.8
7320.20	43.2 Pk	8.2 / 36.5 / 41.6	46.3	V / 1.1 / 35.0	0.0	46.3	54.0	-7.7
8235.00	51.8 Pk	8.4 / 37.5 / 50.0	47.7	H / 1.0 / 0.0	0.0	47.7	54.0	-6.3
8235.00	52.0 Pk	8.4 / 37.5 / 50.0	47.9	V / 1.0 / 0.0	0.0	47.9	54.0	-6.1
9150.00	53.1 Pk	8.8 / 38.6 / 50.2	50.3	H / 1.0 / 0.0	0.0	50.3	54.0	-3.7
9150.00	51.7 Pk	8.8 / 38.6 / 50.2	48.9	V / 1.0 / 0.0	0.0	48.9	54.0	-5.1
High Channel Harmonics								
1852.22	52.5 Pk	3.1 / 26.8 / 36.2	46.3	V / 1.1 / 19.0	0.0	46.3	105.0	-58.7
1852.22	49.9 Pk	3.1 / 26.8 / 36.2	43.7	H / 1.2 / 62.0	0.0	43.7	105.0	-61.3
2778.22	52.4 Pk	4.3 / 29.7 / 37.5	48.9	V / 1.1 / 19.0	0.0	48.9	54.0	-5.1
2778.22	50.7 Pk	4.3 / 29.7 / 37.5	47.2	H / 1.0 / 50.0	0.0	47.2	54.0	-6.8
3704.22	52.9 Pk	5.2 / 31.9 / 38.1	51.9	V / 1.1 / 19.0	0.0	51.9	54.0	-2.1
3704.22	51.5 Pk	5.2 / 31.9 / 38.1	50.5	H / 1.0 / 342.0	0.0	50.5	54.0	-3.5
4630.22	52.4 Pk	6.9 / 32.8 / 41.2	50.8	V / 1.2 / 215.0	0.0	50.8	54.0	-3.2
4630.22	48.6 Pk	6.9 / 32.8 / 41.2	47.0	H / 1.0 / 293.0	0.0	47.0	54.0	-7.0
5556.32	46.4 Pk	6.8 / 34.5 / 41.0	46.8	V / 1.2 / 280.0	0.0	46.8	105.0	-58.2
5556.32	43.9 Pk	6.8 / 34.5 / 41.0	44.3	H / 1.0 / 293.0	0.0	44.3	105.0	-60.7
6482.32	50.7 Pk	8.5 / 35.2 / 41.5	52.8	V / 1.0 / 298.0	0.0	52.8	105.0	-52.2
6482.32	46.2 Pk	8.5 / 35.2 / 41.5	48.4	H / 1.0 / 45.0	0.0	48.4	105.0	-56.6
7408.32	42.8 Pk	8.2 / 36.8 / 42.3	45.4	V / 1.2 / 260.0	0.0	45.4	54.0	-8.6
7408.32	42.9 Pk	8.2 / 36.8 / 42.3	45.5	H / 1.0 / 45.0	0.0	45.5	54.0	-8.5
8334.02	48.2 Pk	8.4 / 37.6 / 50.2	44.0	V / 1.0 / 0.0	0.0	44.0	54.0	-10.0
8334.02	49.7 Pk	8.4 / 37.6 / 50.2	45.5	H / 1.0 / 0.0	0.0	45.5	54.0	-8.5
9260.02	51.6 Pk	9.0 / 38.7 / 51.0	48.2	V / 1.0 / 0.0	0.0	48.2	105.0	-56.8
9260.02	50.3 Pk	9.0 / 38.7 / 51.0	46.9	H / 1.0 / 0.0	0.0	46.9	105.0	-58.1

Field Strength Measurements Fundamental and Harmonics of the Transmitter

Test Report #:	3103930	Test Area:	Pinewood Site 1 (3m)	Temperature:	20	°C
Test Method:	FCC CFR47 part 15.247	Test Date:	13-Sep-2006	Relative Humidity:	30.2	%
EUT Model #:	10-001	EUT Power:	120 VAC 60 Hz	Air Pressure:	102	kPa
EUT Serial #:						
Manufacturer:	Goliath Solutions					
EUT Description:	SpiderIII T4 -R16 System					
Notes:	Tx Port 2					
	Worst case axis was determined during previous testing.					
	No duty cycle correction factor was used.					

Level Key	
Pk – Peak	Nb – Narrow Band
Qp – QuasiPeak	Bb – Broad Band
Av - Average	

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	Duty Cycle Correction	Final Corrected	Limit	DELTA
(MHz)	(dBuV)	(dB) (dBm) (dB)	(dBuV)	(m) (DEG)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
Averaging method for pulsed signals and calculation in accordance to FCC CFR47 Part 15.35 utilized to calculate field strength emissions.								
The testing performed in accordance to FCC CFR47 Part 15.205 (restricted bands of operation) and 15.247 emissions and delta limits were calculated as follows:								
Final Corrected Peak Measurement – Duty Cycle Correction Factor* = Final Calculated Emission								
The Final Calculated Emission was then compared to the Limits in CFR47 Part 15.209 and 15.247 and the emission/limit delta was calculated.								
the DTCF is calculated as follows $20 \cdot \log_{10}(\text{duty cycle in 100ms})$ "not to exceed 20dB"								
Part 15.247 and 15.205 Respectively								
TX port 2								
Low Channel Fundamental								
905.04	89.9 Pk	3.6 / 23.2 / 0.0	116.6	V / 1.0 / 15.0	0.0	116.6	125.0	-8.4
905.04	89.5 Pk	3.6 / 23.2 / 0.0	116.3	H / 1.7 / 15.0	0.0	116.3	125.0	-8.7
Mid Channel Fundamental								
915.05	88.9 Pk	3.6 / 23.2 / 0.0	115.6	H / 1.8 / 8.0	0.0	115.6	125.0	-9.4
915.05	89.4 Pk	3.6 / 23.2 / 0.0	116.2	V / 1.0 / 10.0	0.0	116.2	125.0	-8.8
High Channel Fundamental								
926.05	88.8 Pk	3.6 / 23.3 / 0.0	115.7	V / 1.0 / 167.0	0.0	115.7	125.0	-9.3
926.05	90.4 Pk	3.6 / 23.3 / 0.0	117.3	H / 2.4 / 275.0	0.0	117.3	125.0	-7.7
Low Channel Harmonics.								
1810.10	54.8 Pk	3.1 / 26.6 / 36.1	48.4	V / 1.0 / 3.0	0.0	48.4	105.0	-56.6
1810.10	52.4 Pk	3.1 / 26.6 / 36.1	46	H / 1.2 / 53.0	0.0	46	105.0	-59.0
2715.10	55.1 Pk	4.3 / 29.5 / 37.3	51.6	V / 1.0 / 297.0	0.0	51.6	54.0	-2.4
2715.10	50.5 Pk	4.3 / 29.5 / 37.3	47	H / 1.3 / 48.0	0.0	47	54.0	-7.0
3620.15	51.9 Pk	5.1 / 31.8 / 38.1	50.7	V / 1.0 / 26.0	0.0	50.7	54.0	-3.3
3620.15	52.2 Pk	5.1 / 31.8 / 38.1	51	H / 1.5 / 193.0	0.0	51	54.0	-3.0
4525.25	49.9 Pk	6.7 / 32.6 / 41.2	47.9	V / 1.0 / 26.0	0.0	47.9	54.0	-6.1
4525.25	47.8 Pk	6.7 / 32.6 / 41.2	45.8	H / 1.6 / 147.0	0.0	45.8	54.0	-8.2
5430.35	45.9 Pk	6.8 / 34.4 / 40.7	46.4	V / 1.0 / 310.0	0.0	46.4	54.0	-7.6
5430.35	44.0 Pk	6.8 / 34.4 / 40.7	44.5	H / 1.0 / 20.0	0.0	44.5	54.0	-9.5
6335.35	48.1 Pk	8.2 / 35.0 / 41.5	49.8	V / 1.0 / 302.0	0.0	49.8	105.0	-55.2
6335.35	46.7 Pk	8.2 / 35.0 / 41.5	48.5	H / 1.1 / 306.0	0.0	48.5	105.0	-56.5
7240.35	44.9 Pk	8.1 / 36.3 / 42.0	47.4	V / 1.0 / 0.0	0.0	47.4	105.0	-57.6
7240.35	42.2 Pk	8.1 / 36.3 / 42.0	44.7	H / 1.0 / 0.0	0.0	44.7	105.0	-60.3
8145.35	51.3 Pk	8.4 / 37.4 / 50.0	47.0	V / 1.0 / 0.0	0.0	47.0	54.0	-7.0
8145.35	50.2 Pk	8.4 / 37.4 / 50.0	46.0	H / 1.0 / 0.0	0.0	46.0	54.0	-8.0
9050.35	51.9 Pk	8.6 / 38.5 / 51.3	47.7	V / 1.0 / 0.0	0.0	47.7	54.0	-6.3
9050.35	51.8 Pk	8.6 / 38.5 / 51.3	47.6	H / 1.0 / 0.0	0.0	47.6	54.0	-6.4

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	Duty Cycle Correction	Final Corrected	Limit	DELTA
(MHz)	(dBuV)	(dB) (dBm) (dB)	(dBuV)	(m) (DEG)	(dB)	(dBuV/m)	(dBuV/m)	(dB)

Part 15.247 and 15.205 Respectively

Mid Channel Harmonics

1830.15	58.4 Pk	3.1 / 26.7 / 36.3	51.9	H / 1.3 / 141.0	0.0	51.9	105.0	-53.1
1830.15	56.1 Pk	3.1 / 26.7 / 36.3	49.6	V / 1.1 / 258.0	0.0	49.6	105.0	-55.4
2745.20	54.1 Pk	4.3 / 29.6 / 37.4	50.6	H / 1.0 / 140.0	0.0	50.6	54.0	-3.4
2745.20	55.8 Pk	4.3 / 29.6 / 37.4	52.3	V / 1.1 / 284.0	0.0	52.3	54.0	-1.7
3660.20	51.6 Pk	5.1 / 31.8 / 38.1	50.4	H / 1.5 / 175.0	0.0	50.4	54.0	-3.6
3660.20	52.0 Pk	5.1 / 31.8 / 38.1	50.8	V / 1.1 / 198.0	0.0	50.8	54.0	-3.2
4575.25	50.2 Pk	6.8 / 32.7 / 41.2	48.4	H / 1.8 / 250.0	0.0	48.4	54.0	-5.6
4575.25	51.2 Pk	6.8 / 32.7 / 41.2	49.4	V / 1.2 / 300.0	0.0	49.4	54.0	-4.6
5490.20	46.2 Pk	6.7 / 34.5 / 41.1	46.4	V / 1.0 / 33.0	0.0	46.4	105.0	-58.6
5490.40	44.5 Pk	6.7 / 34.5 / 41.1	44.6	H / 1.2 / 35.0	0.0	44.6	105.0	-60.4
6405.35	49.9 Pk	8.3 / 35.1 / 41.7	51.7	V / 1.0 / 296.0	0.0	51.7	105.0	-53.3
6405.40	47.9 Pk	8.3 / 35.1 / 41.7	49.7	H / 1.2 / 195.0	0.0	49.7	105.0	-55.3
7320.20	43.0 Pk	8.2 / 36.5 / 41.6	46.2	H / 1.2 / 195.0	0.0	46.2	54.0	-7.8
7320.35	43.2 Pk	8.2 / 36.5 / 41.6	46.4	V / 1.0 / 170.0	0.0	46.4	54.0	-7.6
8235.00	50.0 Pk	8.4 / 37.5 / 50.0	45.9	H / 1.0 / 0.0	0.0	45.9	54.0	-8.1
8235.00	50.6 Pk	8.4 / 37.5 / 50.0	46.5	V / 1.0 / 0.0	0.0	46.5	54.0	-7.5
9150.00	50.6 Pk	8.8 / 38.6 / 50.2	47.8	H / 1.0 / 0.0	0.0	47.8	54.0	-6.2
9150.00	51.4 Pk	8.8 / 38.6 / 50.2	48.6	V / 1.0 / 0.0	0.0	48.6	54.0	-5.4

High Channel Harmonics

1852.22	57.0 Pk	3.1 / 26.8 / 36.2	50.8	V / 1.0 / 86.0	0.0	50.8	105.0	-54.2
1852.22	55.9 Pk	3.1 / 26.8 / 36.2	49.7	H / 1.0 / 130.0	0.0	49.7	105.0	-55.3
2778.22	55.0 Pk	4.3 / 29.7 / 37.5	51.5	V / 1.1 / 152.0	0.0	51.5	54.0	-2.5
2778.22	53.0 Pk	4.3 / 29.7 / 37.5	49.5	H / 1.0 / 62.0	0.0	49.5	54.0	-4.5
3704.22	54.9 Pk	5.2 / 31.9 / 38.1	53.9	V / 1.2 / 346.0	0.0	53.9	54.0	-0.1
3704.22	53.3 Pk	5.2 / 31.9 / 38.1	52.3	H / 1.0 / 3.0	0.0	52.3	54.0	-1.7
4630.22	54.7 Pk	6.9 / 32.8 / 41.2	53.1	V / 1.1 / 9.0	0.0	53.1	54.0	-0.9
4630.22	51.6 Pk	6.9 / 32.8 / 41.2	50.1	H / 1.3 / 82.0	0.0	50.1	54.0	-3.9
5556.32	46.9 Pk	6.8 / 34.5 / 41.0	47.3	V / 1.1 / 165.0	0.0	47.3	105.0	-57.7
5556.32	45.2 Pk	6.8 / 34.5 / 41.0	45.6	H / 1.1 / 30.0	0.0	45.6	105.0	-59.4
6482.32	50.3 Pk	8.5 / 35.2 / 41.5	52.5	V / 1.4 / 150.0	0.0	52.5	105.0	-52.5
6482.32	48.2 Pk	8.5 / 35.2 / 41.5	50.4	H / 1.3 / 324.0	0.0	50.4	105.0	-54.6
7408.32	45.5 Pk	8.2 / 36.8 / 42.3	48.2	V / 1.0 / 0.0	0.0	48.2	54.0	-5.8
7408.32	42.9 Pk	8.2 / 36.8 / 42.3	45.5	H / 1.0 / 0.0	0.0	45.5	54.0	-8.5
8334.02	51.0 Pk	8.4 / 37.6 / 50.2	46.8	V / 1.0 / 0.0	0.0	46.8	54.0	-7.2
8334.02	51.7 Pk	8.4 / 37.6 / 50.2	47.5	H / 1.0 / 0.0	0.0	47.5	54.0	-6.5
9260.02	53.2 Pk	9.0 / 38.7 / 51.0	49.8	V / 1.0 / 0.0	0.0	49.8	105.0	-55.2
9260.02	54.1 Pk	9.0 / 38.7 / 51.0	50.7	H / 1.0 / 0.0	0.0	50.7	105.0	-54.3

Field Strength Measurements Fundamental and Harmonics of the Transmitter

Test Report #:	3103930	Test Area:	Pinewood Site 1 (3m)	Temperature:	20	°C
Test Method:	FCC CFR47 part 15.247	Test Date:	14-Sep-2006	Relative Humidity:	30.2	%
EUT Model #:	10-001	EUT Power:	120 VAC 60 Hz	Air Pressure:	102	kPa
EUT Serial #:						
Manufacturer:	Goliath Solutions					
EUT Description:	SpiderIII T4 -R16 System					
Notes:	Tx Port 3					
	Worst case axis was determined during previous testing.					
	No duty cycle correction factor was used.					

Level Key	
Pk – Peak	Nb – Narrow Band
Qp – QuasiPeak	Bb – Broad Band
Av - Average	

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	Duty Cycle Correction	Final Corrected	Limit	DELTA
(MHz)	(dBuV)	(dB) (dBm) (dB)	(dBuV)	(m) (DEG)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
Averaging method for pulsed signals and calculation in accordance to FCC CFR47 Part 15.35 utilized to calculate field strength emissions.								
The testing performed in accordance to FCC CFR47 Part 15.205 (restricted bands of operation) and 15.247 emissions and delta limits were calculated as follows:								
Final Corrected Peak Measurement – Duty Cycle Correction Factor* = Final Calculated Emission								
The Final Calculated Emission was then compared to the Limits in CFR47 Part 15.209 and 15.247 and the emission/limit delta was calculated.								
the DTCF is calculated as follows $20 \cdot \log_{10}(\text{duty cycle in 100ms})$ "not to exceed 20dB"								
Part 15.247 and 15.205 Respectively								
TX port 3								
Low Channel Fundamental								
905.04	90.6 Pk	3.6 / 23.2 / 0.0	117.4	V / 1.0 / 303.0	0.0	117.4	125.0	-7.6
905.04	90.2 Pk	3.6 / 23.2 / 0.0	117.0	H / 1.7 / 346.0	0.0	117.0	125.0	-8.0
Mid Channel Fundamental								
915.05	89.7 Pk	3.6 / 23.2 / 0.0	117.4	H / 1.7 / 347.0	0.0	117.4	125.0	-7.6
915.05	89.6 Pk	3.6 / 23.2 / 0.0	117.0	V / 1.0 / 160.0	0.0	117.0	125.0	-8.0
High Channel Fundamental								
926.05	88.0 Pk	3.6 / 23.3 / 0.0	114.9	V / 1.0 / 127.0	0.0	114.9	125.0	-10.1
926.05	90.5 Pk	3.6 / 23.3 / 0.0	117.3	H / 1.8 / 348.0	0.0	117.3	125.0	-7.7
Low Channel Harmonics								
1810.10	53.9 Pk	3.1 / 26.6 / 36.1	47.5	H / 1.3 / 33.0	0.0	47.5	105.0	-57.5
1810.10	54.2 Pk	3.1 / 26.6 / 36.1	47.8	V / 1.5 / 280.0	0.0	47.8	105.0	-57.2
2715.10	53.8 Pk	4.3 / 29.5 / 37.3	50.3	H / 1.0 / 25.0	0.0	50.3	54.0	-3.7
2715.10	53.2 Pk	4.3 / 29.5 / 37.3	49.7	V / 1.9 / 60.0	0.0	49.7	54.0	-4.3
3620.15	50.7 Pk	5.0 / 31.7 / 38.1	49.4	H / 1.8 / 5.0	0.0	49.4	54.0	-4.6
3620.15	52.0 Pk	5.0 / 31.7 / 38.1	50.7	V / 1.2 / 170.0	0.0	50.7	54.0	-3.3
4525.25	48.2 Pk	6.7 / 32.6 / 41.2	46.2	H / 1.7 / 300.0	0.0	46.2	54.0	-7.8
4525.25	49.7 Pk	6.7 / 32.6 / 41.2	47.7	V / 1.2 / 300.0	0.0	47.7	54.0	-6.3
5430.35	43.8 Pk	6.8 / 34.4 / 40.7	44.2	H / 1.0 / 45.0	0.0	44.2	54.0	-9.8
5430.35	45.3 Pk	6.8 / 34.4 / 40.7	45.7	V / 1.1 / 30.0	0.0	45.7	54.0	-8.3
6335.35	48.6 Pk	8.2 / 35.0 / 41.5	50.3	H / 1.6 / 307.0	0.0	50.3	105.0	-54.7
6335.35	47.9 Pk	8.2 / 35.0 / 41.5	49.6	V / 1.5 / 305.0	0.0	49.6	105.0	-55.4
7240.35	43.1 Pk	8.1 / 36.3 / 42.0	45.6	H / 1.0 / 0.0	0.0	45.6	105.0	-59.4
7240.35	42.9 Pk	8.1 / 36.3 / 42.0	45.4	V / 1.0 / 330.0	0.0	45.4	105.0	-59.6
8145.35	49.6 Pk	8.4 / 37.4 / 50.0	45.4	H / 1.0 / 0.0	0.0	45.4	54.0	-8.6
8145.35	49.0 Pk	8.4 / 37.4 / 50.0	44.8	V / 1.0 / 0.0	0.0	44.8	54.0	-9.2
9050.35	49.9 Pk	8.6 / 38.5 / 51.3	45.8	H / 1.0 / 0.0	0.0	45.8	54.0	-8.2
9050.35	51.6 Pk	8.6 / 38.5 / 51.3	47.4	V / 1.0 / 0.0	0.0	47.4	54.0	-6.6

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	Duty Cycle Correction	Final Corrected	Limit	DELTA
(MHz)	(dBuV)	(dB) (dBm) (dB)	(dBuV)	(m) (DEG)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
Part 15.247 and 15.205 Respectively								
Mid Channel Harmonics								
1830.15	55.2 Pk	3.1 / 26.7 / 36.3	48.7	V / 1.5 / 130.0	0.0	48.7	105.0	-56.3
1830.15	56.1 Pk	3.1 / 26.7 / 36.3	49.6	H / 1.0 / 73.0	0.0	49.6	105.0	-55.4
2745.20	54.4 Pk	4.3 / 29.6 / 37.4	50.9	V / 1.4 / 223.0	0.0	50.9	54.0	-3.1
2745.20	54.5 Pk	4.3 / 29.6 / 37.4	51	H / 1.1 / 308.0	0.0	51	54.0	-3.0
3660.20	50.9 Pk	5.1 / 31.8 / 38.1	49.7	V / 1.2 / 200.0	0.0	49.7	54.0	-4.3
3660.20	48.5 Pk	5.1 / 31.8 / 38.1	47.3	H / 1.4 / 6.0	0.0	47.3	54.0	-6.7
4575.25	50.6 Pk	6.8 / 32.7 / 41.2	48.8	V / 1.2 / 327.0	0.0	48.8	54.0	-5.2
4575.25	48.8 Pk	6.8 / 32.7 / 41.2	47.0	H / 1.5 / 38.0	0.0	47.0	54.0	-7.0
5490.20	44.2 Pk	6.7 / 34.5 / 41.1	44.4	V / 1.1 / 340.0	0.0	44.4	105.0	-60.6
5490.20	46.5 Pk	6.7 / 34.5 / 41.1	46.6	H / 1.5 / 47.0	0.0	46.6	105.0	-58.4
6405.35	48.9 Pk	8.3 / 35.1 / 41.7	50.7	V / 1.0 / 12.0	0.0	50.7	105.0	-54.3
6405.35	47.7 Pk	8.3 / 35.1 / 41.7	49.5	H / 1.4 / 198.0	0.0	49.5	105.0	-55.5
7320.35	44.7 Pk	8.2 / 36.5 / 41.6	47.8	V / 1.0 / 0.0	0.0	47.8	54.0	-6.2
7320.35	40.2 Pk	8.2 / 36.5 / 41.6	43.3	H / 1.0 / 0.0	0.0	43.3	54.0	-10.7
8235.00	48.6 Pk	8.4 / 37.5 / 50.0	44.5	V / 1.0 / 0.0	0.0	44.5	54.0	-9.5
8235.00	50.2 Pk	8.4 / 37.5 / 50.0	46.1	H / 1.0 / 0.0	0.0	46.1	54.0	-7.9
9150.00	51.0 Pk	8.8 / 38.6 / 50.2	48.2	V / 1.0 / 0.0	0.0	48.2	54.0	-5.8
9150.00	50.0 Pk	8.8 / 38.6 / 50.2	47.1	H / 1.0 / 0.0	0.0	47.1	54.0	-6.9
High Channel Harmonics								
1852.22	54.2 Pk	3.1 / 26.8 / 36.2	48	V / 1.0 / 71.0	0.0	48	105.0	-57.0
1852.22	53.5 Pk	3.1 / 26.8 / 36.2	47.3	H / 1.4 / 62.0	0.0	47.3	105.0	-57.7
2778.22	50.2 Pk	4.3 / 29.7 / 37.5	46.7	H / 1.4 / 194.0	0.0	46.7	54.0	-7.3
2778.22	52.9 Pk	4.3 / 29.7 / 37.5	49.4	V / 1.1 / 215.0	0.0	49.4	54.0	-4.6
3704.22	50.5 Pk	5.2 / 31.9 / 38.1	49.5	H / 1.1 / 170.0	0.0	49.5	54.0	-4.5
3704.22	52.9 Pk	5.2 / 31.9 / 38.1	51.9	V / 1.2 / 354.0	0.0	51.9	54.0	-2.1
4630.22	50.4 Pk	6.9 / 32.8 / 41.2	48.9	H / 1.2 / 30.0	0.0	48.9	54.0	-5.1
4630.22	52.7 Pk	6.9 / 32.8 / 41.2	51.1	V / 1.2 / 330.0	0.0	51.1	54.0	-2.9
5556.32	43.3 Pk	6.8 / 34.5 / 41.0	43.7	H / 1.0 / 65.0	0.0	43.7	105.0	-61.3
5556.32	39.5 Pk	6.8 / 34.5 / 41.0	39.8	V / 1.0 / 141.0	0.0	39.8	105.0	-65.2
6482.32	46.8 Pk	8.5 / 35.2 / 41.5	48.9	H / 1.3 / 300.0	0.0	48.9	105.0	-56.1
6482.32	49.2 Pk	8.5 / 35.2 / 41.5	51.4	V / 1.0 / 141.0	0.0	51.4	105.0	-53.6
7408.32	39.4 Pk	8.2 / 36.8 / 42.3	42.1	H / 1.0 / 0.0	0.0	42.1	54.0	-11.9
7408.32	39.5 Pk	8.2 / 36.8 / 42.3	42.1	V / 1.0 / 210.0	0.0	42.1	54.0	-11.9
8334.02	49.1 Pk	8.4 / 37.6 / 50.2	44.9	H / 1.0 / 0.0	0.0	44.9	54.0	-9.1
8334.02	48.1 Pk	8.4 / 37.6 / 50.2	43.9	V / 1.0 / 0.0	0.0	43.9	54.0	-10.1
9260.02	49.4 Pk	9.0 / 38.7 / 51.0	46.0	H / 1.0 / 0.0	0.0	46.0	105.0	-59.0
9260.02	51.0 Pk	9.0 / 38.7 / 51.0	47.7	V / 1.0 / 0.0	0.0	47.7	105.0	-57.3

Field Strength Measurements Fundamental and Harmonics of the Transmitter

Test Report #:	3103930	Test Area:	Pinewood Site 1 (3m)	Temperature:	20	°C
Test Method:	FCC CFR47 part 15.247	Test Date:	14-Sep-2006	Relative Humidity:	30.2	%
EUT Model #:	10-001	EUT Power:	120 VAC 60 Hz	Air Pressure:	102	kPa
EUT Serial #:						
Manufacturer:	Goliath Solutions					
EUT Description:	SpiderIII T4 -R16 System					
Notes:	Tx Port 4					
	Worst case axis was determined during previous testing.					
	No duty cycle correction factor was used.					

Level Key	
Pk – Peak	Nb – Narrow Band
Qp – QuasiPeak	Bb – Broad Band
Av - Average	

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	Duty Cycle Correction	Final Corrected	Limit	DELTA
(MHz)	(dBuV)	(dB) (dBm) (dB)	(dBuV)	(m) (DEG)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
Averaging method for pulsed signals and calculation in accordance to FCC CFR47 Part 15.35 utilized to calculate field strength emissions.								
The testing performed in accordance to FCC CFR47 Part 15.205 (restricted bands of operation) and 15.247 emissions and delta limits were calculated as follows:								
Final Corrected Peak Measurement – Duty Cycle Correction Factor* = Final Calculated Emission								
The Final Calculated Emission was then compared to the Limits in CFR47 Part 15.209 and 15.247 and the emission/limit delta was calculated.								
the DTCF is calculated as follows $20 \cdot \log_{10}(\text{duty cycle in 100ms})$ "not to exceed 20dB"								
Part 15.247 and 15.205 Respectively								
TX port 4								
Low Channel Fundamental								
905.04	90.1 Pk	3.6 / 23.2 / 0.0	116.9	H / 1.7 / 347.0	0.0	116.9	125.0	-8.1
905.04	90.6 Pk	3.6 / 23.2 / 0.0	117.4	V / 1.0 / 300.0	0.0	117.4	125.0	-7.6
Mid Channel Fundamental								
915.05	89.6 Pk	3.6 / 23.2 / 0.0	116.3	V / 1.0 / 299.0	0.0	116.3	125.0	-8.7
915.05	89.8 Pk	3.6 / 23.2 / 0.0	116.6	H / 1.7 / 342.0	0.0	116.6	125.0	-8.4
High Channel Fundamental								
926.05	90.4 Pk	3.6 / 23.3 / 0.0	117.3	H / 1.7 / 344.0	0.0	117.3	125.0	-7.7
926.05	88.2 Pk	3.6 / 23.3 / 0.0	115.1	V / 1.0 / 304.0	0.0	115.1	125.0	-9.9
Low Channel Harmonics.								
1810.10	55.9 Pk	3.1 / 26.6 / 36.1	49.5	V / 1.0 / 221.0	0.0	49.5	105.0	-55.5
1810.10	52.6 Pk	3.1 / 26.6 / 36.1	46.2	H / 1.9 / 203.0	0.0	46.2	105.0	-58.8
2715.10	54.5 Pk	4.3 / 29.5 / 37.3	51	V / 1.4 / 165.0	0.0	51	54.0	-3.0
2715.10	53.1 Pk	4.3 / 29.5 / 37.3	49.6	H / 1.0 / 203.0	0.0	49.6	54.0	-4.4
3620.15	48.1 Pk	5.0 / 31.7 / 38.1	46.8	V / 1.4 / 356.0	0.0	46.8	54.0	-7.2
3620.15	48.8 Pk	5.0 / 31.7 / 38.1	47.5	H / 1.2 / 315.0	0.0	47.5	54.0	-6.5
4525.25	48.4 Pk	6.7 / 32.6 / 41.2	46.4	V / 1.0 / 50.0	0.0	46.4	54.0	-7.6
4525.25	48.1 Pk	6.7 / 32.6 / 41.2	46.1	H / 1.5 / 277.0	0.0	46.1	54.0	-7.9
5430.35	47.3 Pk	6.8 / 34.4 / 40.7	47.7	V / 1.6 / 98.0	0.0	47.7	54.0	-6.3
5430.35	45.4 Pk	6.8 / 34.4 / 40.7	45.8	H / 1.3 / 57.0	0.0	45.8	54.0	-8.2
6335.35	51.3 Pk	8.2 / 35.0 / 41.5	53.0	V / 1.5 / 147.0	0.0	53.0	105.0	-52.0
6335.35	48.4 Pk	8.2 / 35.0 / 41.5	50.2	H / 1.4 / 307.0	0.0	50.2	105.0	-54.8
7240.35	40.9 Pk	8.1 / 36.3 / 42.0	43.4	V / 1.0 / 0.0	0.0	43.4	105.0	-61.6
7240.35	41.2 Pk	8.1 / 36.3 / 42.0	43.7	H / 1.0 / 0.0	0.0	43.7	105.0	-61.3
8145.35	50.4 Pk	8.4 / 37.4 / 50.0	46.2	V / 1.0 / 0.0	0.0	46.2	54.0	-7.8
8145.35	48.8 Pk	8.4 / 37.4 / 50.0	44.6	H / 1.0 / 0.0	0.0	44.6	54.0	-9.4
9050.35	53.2 Pk	8.6 / 38.5 / 51.3	49.1	V / 1.0 / 0.0	0.0	49.1	54.0	-4.9
9050.35	52.0 Pk	8.6 / 38.5 / 51.3	47.8	H / 1.0 / 0.0	0.0	47.8	54.0	-6.2

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	Duty Cycle Correction	Final Corrected	Limit	DELTA
(MHz)	(dBuV)	(dB) (dBm) (dB)	(dBuV)	(m) (DEG)	(dB)	(dBuV/m)	(dBuV/m)	(dB)

Part 15.247 and 15.205 Respectively

Mid Channel Harmonics

1830.15	55.6 Pk	3.1 / 26.7 / 36.3	49.1	H / 1.2 / 81.0	0.0	49.1	105.0	-55.9
1830.15	55.6 Pk	3.1 / 26.7 / 36.3	49.1	V / 1.0 / 341.0	0.0	49.1	105.0	-55.9
2745.20	53.5 Pk	4.3 / 29.6 / 37.4	50	H / 1.0 / 135.0	0.0	50	54.0	-4.0
2745.20	56.1 Pk	4.3 / 29.6 / 37.4	52.6	V / 1.5 / 306.0	0.0	52.6	54.0	-1.4
3660.20	49.1 Pk	5.1 / 31.8 / 38.1	47.9	H / 1.5 / 135.0	0.0	47.9	54.0	-6.1
3660.20	49.2 Pk	5.1 / 31.8 / 38.1	48	V / 1.0 / 125.0	0.0	48	54.0	-6.0
4575.25	49.6 Pk	6.8 / 32.7 / 41.2	47.9	H / 1.3 / 26.0	0.0	47.9	54.0	-6.1
4575.25	49.8 Pk	6.8 / 32.7 / 41.2	48.0	V / 1.9 / 130.0	0.0	48.0	54.0	-6.0
5490.20	45.1 Pk	6.7 / 34.5 / 41.1	45.3	H / 1.4 / 32.0	0.0	45.3	105.0	-59.7
5490.20	46.5 Pk	6.7 / 34.5 / 41.1	46.6	V / 1.0 / 33.0	0.0	46.6	105.0	-58.4
6405.35	47.1 Pk	8.3 / 35.1 / 41.7	48.9	H / 1.1 / 130.0	0.0	48.9	105.0	-56.1
6405.35	50.6 Pk	8.3 / 35.1 / 41.7	52.3	V / 1.1 / 296.0	0.0	52.3	105.0	-52.7
7320.35	42.9 Pk	8.2 / 36.5 / 41.6	46.0	H / 1.0 / 0.0	0.0	46.0	54.0	-8.0
7320.35	42.6 Pk	8.2 / 36.5 / 41.6	45.8	V / 1.0 / 0.0	0.0	45.8	54.0	-8.2
8235.00	50.0 Pk	8.4 / 37.5 / 50.0	45.9	H / 1.0 / 0.0	0.0	45.9	54.0	-8.1
8235.00	50.1 Pk	8.4 / 37.5 / 50.0	46.0	V / 1.0 / 0.0	0.0	46.0	54.0	-8.0
9150.00	51.5 Pk	8.8 / 38.6 / 50.2	48.6	H / 1.0 / 0.0	0.0	48.6	54.0	-5.4
9150.00	50.6 Pk	8.8 / 38.6 / 50.2	47.8	V / 1.0 / 0.0	0.0	47.8	54.0	-6.2

High Channel Harmonics

1852.22	56.4 Pk	3.1 / 26.8 / 36.2	50.2	V / 1.1 / 80.0	0.0	50.2	105.0	-54.8
1852.22	55.5 Pk	3.1 / 26.8 / 36.2	49.3	H / 1.0 / 248.0	0.0	49.3	105.0	-55.7
2778.22	53.2 Pk	4.3 / 29.7 / 37.5	49.7	V / 1.3 / 185.0	0.0	49.7	54.0	-4.3
2778.22	52.2 Pk	4.3 / 29.7 / 37.5	48.7	H / 1.1 / 217.0	0.0	48.7	54.0	-5.3
3704.22	52.6 Pk	5.2 / 31.9 / 38.1	51.6	V / 1.0 / 160.0	0.0	51.6	54.0	-2.4
3704.22	50.3 Pk	5.2 / 31.9 / 38.1	49.3	H / 1.2 / 340.0	0.0	49.3	54.0	-4.7
4630.22	51.7 Pk	6.9 / 32.8 / 41.2	50.1	V / 1.0 / 17.0	0.0	50.1	54.0	-3.9
4630.22	51.2 Pk	6.9 / 32.8 / 41.2	49.6	H / 1.2 / 33.0	0.0	49.6	54.0	-4.4
5556.32	43.6 Pk	6.8 / 34.5 / 41.0	43.9	V / 1.1 / 180.0	0.0	43.9	105.0	-61.1
5556.32	44.8 Pk	6.8 / 34.5 / 41.0	45.1	H / 1.4 / 33.0	0.0	45.1	105.0	-59.9
6482.32	50.5 Pk	8.5 / 35.2 / 41.5	52.6	V / 1.3 / 7.0	0.0	52.6	105.0	-52.4
6482.32	47.3 Pk	8.5 / 35.2 / 41.5	49.4	H / 1.0 / 148.0	0.0	49.4	105.0	-55.6
7408.32	42.1 Pk	8.2 / 36.8 / 42.3	44.7	V / 1.0 / 0.0	0.0	44.7	54.0	-9.3
7408.32	40.6 Pk	8.2 / 36.8 / 42.3	43.3	H / 1.0 / 0.0	0.0	43.3	54.0	-10.7
8334.02	51.1 Pk	8.4 / 37.6 / 50.2	46.9	V / 1.0 / 0.0	0.0	46.9	54.0	-7.1
8334.02	50.6 Pk	8.4 / 37.6 / 50.2	46.4	H / 1.0 / 0.0	0.0	46.4	54.0	-7.6
9260.02	51.5 Pk	9.0 / 38.7 / 51.0	48.1	V / 1.0 / 0.0	0.0	48.1	105.0	-56.9
9260.02	51.6 Pk	9.0 / 38.7 / 51.0	48.2	H / 1.0 / 0.0	0.0	48.2	105.0	-56.8

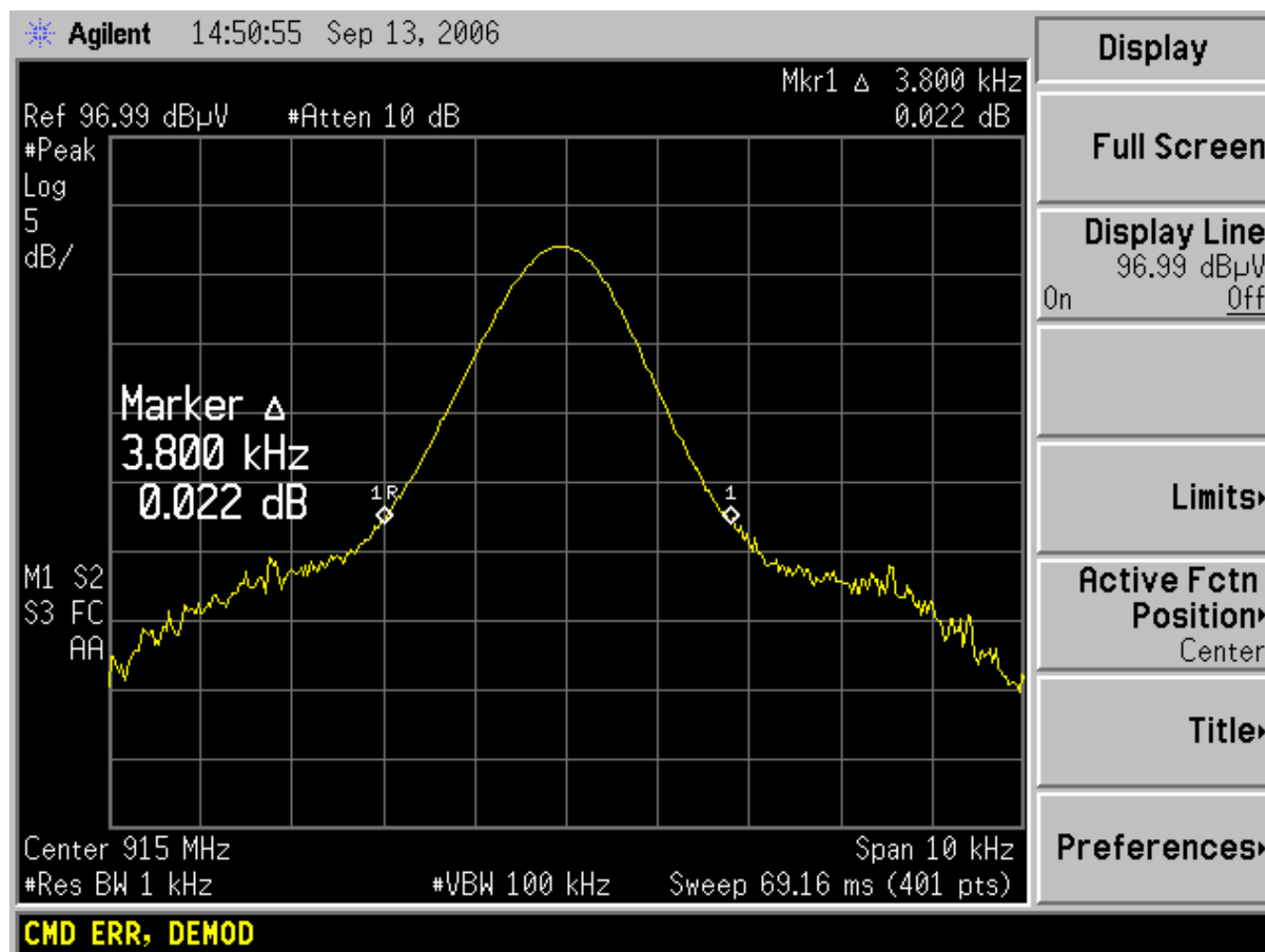
15.247 (a)(1)(i) Test Data

20dB Bandwidth

20 dB Bandwidth

Test Report #:	3103930	Test Area:	Pinewood Site 1 (3m)
Test Method:	FCC CFR47 part 15.247	Test Date:	13-Sep-2006
EUT Model #:	10-001	EUT Power:	120 VAC 60 Hz
EUT Serial #:			
Manufacturer:	Goliath Solutions		
EUT Description:	SpiderIII T4 -R16 System		
Notes:			

Temperature:	20	°C
Relative Humidity:	30.2	%
Air Pressure:	102	kPa



List of Equipment Utilized for Final Test

Project Report

Technician Jordan Belliston

Project 3103930

Begin Date: 11-Sept-2006

End Date: 15-Sept-2006

Capital Asset ID	Manufacturer	Model #	Serial #	Description	Test Performed	Service Type	Service Date	Service Due
18730	Hewlett-Packard	11947A	2820A00277	Transient Limiter	C Conducted Emissions	For Ver	2/7/2006	2/7/2007
18890	RHODE & SCHWARZ	ESH2-Z5	830364/002	LISN 50 ohm/50uH 3 line (1kHz - 30 MHz)	C Conducted Emissions	For Ver	3/7/2006	3/7/2007
18909	RHODE & SCHWARZ	ESHS 30	842806/001	EMI Test Receiver	C Conducted Emissions	For Cal	11/10/2005	11/10/2006
18887	EMCO	3115	9205-3886	Horn Antenna 1-18GHz	R Radiated Emissions	For Cal	3/27/2006	3/27/2007
18888	EMCO	3146	9402-3775	Log Periodic Antenna (200-1000MHz)	R Radiated Emissions	For Cal	9/30/2005	9/30/2006
18889	EMC TEST SYSTEMS	3109	3142	Biconical Antenna 30-300MHz	R Radiated Emissions	For Cal	9/30/2005	9/30/2006
18897	EMCO	6502	9205-2738	Magnetic loop	R Radiated Emissions	For Cal	8/8/2006	8/8/2007
18900	Avantek	AFT97-8434-10F	1007	RF Pre-Amplifier (4-8 GHz)	R Radiated Emissions	For Ver	4/4/2006	4/4/2007
18901	Avantek	AWT-18037	1002	RF Pre-Amplifier (8-18 GHz)	R Radiated Emissions	For Ver	4/4/2006	4/4/2007
18906	Mini-Circuits Lab	ZHL-42	N052792-2	Amplifier	R Radiated Emissions	For Ver	4/4/2006	4/4/2007
18912	Hewlett-Packard	8447F	3113A05545	9 kHz- 1.3GHz Pre Amp	R Radiated Emissions	For Ver	5/8/2006	5/8/2007
18913	Hewlett-Packard	E7405A	My44211889	Spectrum Analyzer	R Radiated Emissions	For Cal	12/14/2005	12/14/2006
18919	Hewlett-Packard	8594E	3223A00145	Spectrum Analyzer	R Radiated Emissions	For Cal	1/31/2006	1/31/2007

Intertek ETL Semko

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Appendix B

Test Plan
and
Constructional Data Form

To be supplied by the customer

Appendix C

Measurement Protocol

And

Test Procedures

MEASUREMENT PROTOCOL

GENERAL INFORMATION

Test Methodology

Conducted and radiated emission testing is performed according to the procedures in ANSI C63.4 & CNS13438.

Justification

The Equipment Under Test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions. A cable is connected to each available port and either terminated with a peripheral into its characteristic impedance or left unterminated. When appropriate, the cables are manually manipulated with respect to each other to obtain maximum emissions from the unit.

CONDUCTED EMISSIONS

The final level, expressed in dB μ V, is arrived at by taking the reading directly from the EMI receiver. This level is compared directly to the applicable limit.

To convert between dB μ V and μ V, the following conversions apply:

- $\text{dB}\mu\text{V} = 20(\log \mu\text{V})$
- $\mu\text{V} = \text{Inverse log}(\text{dB}\mu\text{V}/20)$

RADIATED EMISSIONS

The final level, expressed in dB μ V/m, is arrived at by taking the reading from the spectrum analyzer (Level dB μ V) and adding the antenna correction factor and cable loss factor (Factor dB) to it. This result then has the applicable limit subtracted from it to provide the Delta which gives the tabular data as shown in the data sheets in Attachment B. The amplifier gain is automatically accounted for by using an analyzer offset.

Example: At a Test Frequency of 30 MHz, with a peak reading on the spectrum analyzer or measuring receiver of 14 dB μ V:

Measured Level	+	Transducer & Cable Loss factor	=	Corrected Reading	Specification Limit	-	Corrected Reading	=	Delta Specification
(dB μ V)		(dB)		(dB μ V/m)	(dB μ V/m)		(dB μ V/m)		
14.0		14.9		28.9	40.0		28.9		-11.1

DETAILS OF TEST PROCEDURES

General Standard Information

The test methods used comply with ANSI C63.4-2003 - "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz."

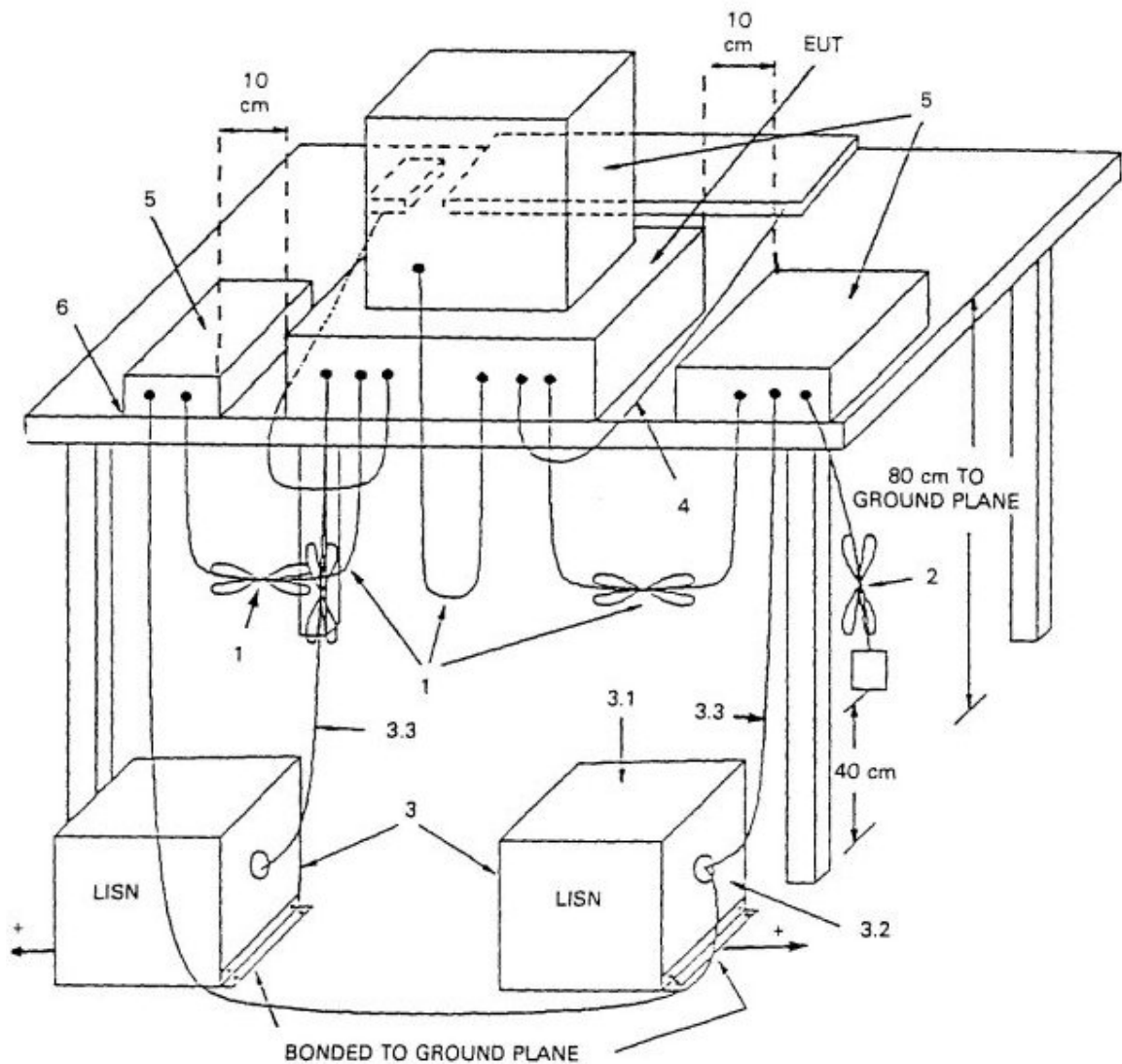
Conducted Emissions

Conducted emissions on the 50 Hz and/or 60 Hz power interface of the EUT are measured in the frequency range of 150 kHz to 30 MHz. The measurements are performed using a receiver, which has CISPR characteristic bandwidth and quasi-peak detection, and a Line Impedance Stabilization Network (LISN), with 50 Ω /50 μ H (CISPR 16) characteristics. Table top equipment is placed on a non-conducting table 80 centimeters above the floor and is positioned 40 centimeters from the vertical ground plane (wall) of the screen room. In some cases, a pre-scan using a spectrum analyzer is initially performed on the units comprising the system under test to locate the highest emissions. If the minimum passing margin appears to be less than 20 dB with a peak mode measurement, the emissions are re-measured using a tuned receiver or spectrum analyzer with quasi-peak and average detection and recorded on the data sheets.

Radiated Emissions

Radiated emissions from the EUT are measured in the frequency range of 30 to 22GHz using a spectrum analyzer and appropriate broadband linearly polarized antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection and measurements above 1000 MHz are made with a 1 MHz/6 dB bandwidth and peak detection. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimeters above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. Interface cables that are closer than 40 centimeters to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimeters from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna is positioned 3, 10 or 30 meters horizontally from the EUT. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarizations and the EUT are rotated 360 degrees.

Conducted Emissions Diagram:



Radiated Emissions Diagram:

